Migration and Movements of Pacific Salmon, Atlantic Salmon, and Steelhead Trout - A Bibliography 1900-1982

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Fisheries and Aquatic Sciences No. 1413

October 1985

MIGRATION AND MOVEMENTS OF PACIFIC SALMON, ATLANTIC SALMON, AND STEELHEAD TROUT - A BIBLIOGRAPHY 1900-1982

by

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ABSTRACT

Shepard, C., G. Miller, and C. Groot. 1985. Migration and movements of Pacific salmon, Atlantic salmon, and steelhead trout - a bibliography 1900 - 1982. Can. Tech. Rep. Fish. Aquat. Sci. 1413: 450 p.

Indexed list of citations relating to physiological, behavioural, and ecological aspects of migration and movements of Pacific salmon (genus *Oncorhynchus*), Atlantic salmon (*Salmo salar*), and Steelhead trout (*Salmo gairdneri*) from the beginning of 1900 to the end of 1982.

RÉSUMÉ

Shepard, C., G. Miller, and C. Groot. 1985. Migration and movements of Pacific salmon, Atlantic salmon, and steelhead trout - a bibliography 1900 - 1982. Can. Tech. Rep. Fish. Aquat. Sci. 1413: 450 p.

On présente dans ce rapport une liste indexée de citations ayant trait aux aspects écologique, comportemental et physiologique de la migration et des déplacements de saumons du Pacifique (genre *Oncorhynchus*), de saumons de l'Atlantique (*Salmo salar*) et de truites arc-en-ciel (*Salmo gairdneri*) de début des années 1900 à la fin de 1982.

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INTRODUCTION

This bibliography comprises a significant part of the available literature on physiological, behavioural, and ecological aspects of migration and movements of Pacific salmon (genus Oncorhynchus), Atlantic salmon (Salmo salar), and steelhead trout (Salmo gairdneri) from the beginning of 1900 to the end of 1982. It covers material published in primary journals and also numerous papers from technical series and from studies printed as theses. The coverage is most comprehensive for literature dealing with Pacific salmon along the west coast of North America.

The reference material was obtained from computer searches of data bases, including Biosis, Zoological Record, and Dissertation Abstracts International, and from manual searches of fisheries journals and technical series, published bibliographies, abstracting series and reference sections of appropriate papers.

The majority of papers included in this bibliography were examined and annotated with keywords. The few cases where only the title or an abstract was available as information of content, are indicated by a note following the citation.

Each reference was examined with respect to 11 different categories:

(1) Species. Each of the salmon species dealt with in the paper was identified.

(2) Life stage. The stages of development for each species were described.

(3) Geographic. The geographic area in which the reported study occurred was noted.

(4) Habitat. The type of environment the fish inhabited was recorded.

(5) Migration events. The differing processes and events of migration were described.

(6) Migration parameters. The physical aspects of migration are detailed (i.e. route, pattern, speed).

(7) Migration mechanism. The underlying processes of migratory behaviour are noted.

(8) Migration influences. The factors affecting migration are listed.

(9) Anatomical systems. The physiological systems involved in migration are outlined.

(10) Discipline. The disciplinary approach used in the reported study are described.

(11) Methods and techniques. The different methods and techniques used in the study are detailed.

Keywords were assigned to each reference from a list of terms compiled for each category. An outline of the categories and the keywords follows.

In the annotation, the main themes are separated from the modifier by a dash. Slashes are used to separate several themes from one another. Modifiers are strung together with commas.

The bibliography consists of a list of references followed by a series of indexes. The references are arranged alphabetically by author or authors and then by date. Each citation is assigned a sequential number by which it is identified in the indices.

The indices have been colour keyed for easy use. The author index can be found on the green pages. The species/life stage index is pink. The remaining indices, geographic, habitat, migration events, migration parameter, migration mechanisms, migration influences, anatomical systems, discipline and methods and techniques are found in the yellow section.

Several indices can be used simultaneously, both in searches of the bibliography or of the computerized database. The authors would appreciate learning of errors or ommissions that readers and users may discover in this bibliography. We would also like to hear how the particular subject coding system used here might be improved on the basis of actual use.

The data used to compile this bibliography is stored on magnetic tape, filed at the Pacific Biological Station, Nanaimo, B.C., Canada V9R 5K6, and can be searched there on line. The librarian at the Pacific Biological Station should be contacted for further information regarding the database or specific search requests. Address: The Librarian, Fisheries Research Branch, Department of Fisheries and Oceans, Pacific Biological Station, Nanaimo, B.C., Canada V9R 5K6. Tel. area code 604 756-7000.

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OUTLINE OF KEY WORDS

SPECIES

Oncorhynchus:

Amago Salmon
Chinook Salmon
Chum Salmon
Coho Salmon
Masu Salmon
Pink Salmon
Sockeye Salmon

Salmo

Atlantic Salmon
Steelhead Trout

General

Pacific Salmon (General)
Salmon (General)

LIFE STAGE

Alevin

- hatching to emergence

Fry

- emergence to arrival at nursery area

Fingerling

- arrival at nursery area to smoltification

Smolt

- smoltification to ocean entry

Juvenile

- freshwater stage not specified

Immature

- Ocean entry to beginning of homing migration

Mature

- beginning of homing migration to spawning

Kelt

- spawning to ocean re-entry

Residual

-

Landlocked

-

GEOGRAPHIC LOCATION

Pacific Region

- North America
  - Western Alaska
  - Central Alaska
  - Southeastern Alaska
  - Yukon
  - Northern British Columbia
  - Southern British Columbia
  - Washington
  - Oregon
  - California
  - Colorado, Idaho
  - Mexico

Asia

- Eastern Kamchatka to Chuchuki Peninsula
- Sea of Okhotsk
  - includes adjacent territories
- Sea of Japan
  - includes Korea and adjacent territories
- Japan

South Pacific

- New Zealand

Altantic Region

- Greenland
- Iceland and Northern Europe
- Southern Europe

- Atlantic Canada and United States
- Great Lakes

Arctic Region

- Arctic North America
- Eastern Arctic Russia
- Western Arctic Russia

Ocean Regions

- Bering Sea
- Eastern North Pacific
- Central North Pacific
- Western North Pacific
- Eastern North Atlantic
- Western North Atlantic

Habitat

- Lake
- Reservoir or Impoundment
- River
- Tributary
- Estuary
- Inshore
- Open Ocean
- Artifical Obstruction
- Natural Obstruction

Migration Events

- Migration (General)
- Non-Migratory Movements
- Initiation of Downstream Migration
- Smoltification
- Desmoltification
- Seawater adaptation
- Homing
- Schooling
- Initiation of Homing Migration
- Initiation Upstream Migration freshwater adaptation
- Initiation of Stream Entry
- Straying
- Termination of Migration
- Reverse Migration

Migration Parameters

- Diel Timing
    - time of day
- Direction
    - compass direction
- Horizontal Distribution (Geographic)
    -
- Pattern
    - route followed by habitat type
- Route
    - route followed by geographical location
- Seasonal Timing
    - time of year
- Speed of Migration
    - rate of travel
- Vertical Distribution
    -
- Vertical Movement
    -

Migration Mechanisms

- Direction Finding (General)
- Imprinting and Learning
- Navigation
- Orientation
- Preference
- Random Movement
- Taxis
- Voluntary Displacement

Migration Influences

- Age
- Aggressive Behaviour and Territoriality
- Celestial Cues
- Current
- Disease
- Dissolved Gas Concentrations
- Electric fields
- Food Availability
- Gravity
- Inertial Cues
- Landmarks
- Light Intensity
- Magnetic Fields
- Obstructions

- Odors
- Parasites
- Pheromones
- Photoperiod
- Pollutants
- Population Density
- Predation
- Reservoirs and Impoundments
- Salinity
- Size and Growth
- Sound
- Stage of Migration
    - physiological or morphological changes
- Tide
- Time of Day
- Time of Year
- Turbitity
- Visual Images
- Water Level and Flow Rate
- Water Pressure
- Water Temperature
- Weather
- Influences (miscellaneous)

Anatomical Systems

- Organ Systems (General)
- Circulatory System
- Digestive Systems
- Endocrine System (General)
    - Gonadal System
    - Pineal System
    - Pituitary System
    - Thyroid System
    - Ultimobranchial System
- Interrenal System
- Locomotory System
- Olfactory System
- Osoregulatory and Excretory System
- Reproductive System
- Respiratory System
- Skeletal and Integumentary System
- Visual System

Disciplines

- Behaviour
- Energetics
- Evolution
- Genetic Aspects
- Morphological Aspects
- Physiological and Biochemical Aspects

Methods and Techniques

- Capture
  - gillnetting, longlining, seining, etc.
- Counts
  - fence counts, fyke net counts, etc.
- Displacement
  - artificial relocation of fish
- Guiding
  - artifical redirection
- Hydroacoustics
- Laboratory Study
- Marking
- Modelling
- Occlusion
  - modification of sense organ to render inoperative
- Sonic or Radio Tracking
- Stock Identification
  - Biogeochemical Analysis
  - Electrophoresis and Serology
  - Morphometrics and Meristics
  - Otolith Analysis
  - Parasite Tags
  - Scale Analysis
- Tagging

1

Abakumov, V.A. 1961.
Seasonal races among anadromous fishes. -- Vopr. Ikhtiol. 17:179-190 (Fish. Res. Board Can. Transl. Ser. 353).

Chum Salmon - Mature / River / Seasonal Timing - Evolution

2

Abramov, V.V. 1949.
Adaptive features of the young Pacific salmon belonging to the genus *Oncorhynchus*. -- Dokl. Akad. Nauk SSR. 67(2):393-396 (*Pp.1-5 in* Pacific salmon: Selected articles from Soviet periodicals. -- Jerusalem: Israel Program for Scientific Translations. 1961.).

Pacific Salmon (General) - Juvenile / Migration (General)

3

Adams, B.L., W.S. Zaugg, and L.R. McLain. 1973.
Temperature effect on parr-smolt transformation in steelhead trout (*Salmo gairdneri*) as measured by gill sodium - potassium stimulated adenosine triphosphatase. -- Comp. Biochem. Physiol. 44A:1333-1339.

Steelhead Trout - Fingerling, Smolt / Osmoregulatory and Excretory System, Smoltification, Seawater Adaptation - Water Temperature / Laboratory Study

4

Adams, B.L., W.S. Zaugg, and L.R. McLain. 1975.
Inhibition of salt water survival and Na-K-ATPase elevation in steelhead trout (*Salmo gairdneri*) by moderate water temperatures. -- Trans. Am. Fish. Soc. 104(4):766-769.

Steelhead Trout - Fingerling, Smolt / Smoltification - Water Temperature / Osmoregulatory and Excretory System - Physiological and Biochemical Aspects / Seawater Adaptation / Laboratory Study

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Aida, K., R.S. Nishioka, and H.A. Bern. 1980.
Changes in the Corpuscles of Stannius of coho salmon (*Oncorhynchus kisutch*) during smoltification and seawater adaptation. -- Gen. Comp. Endocrinol. 41(3):296-304.

Coho Salmon - Smolt / Smoltification, Seawater Adaptation - Physiological and Biochemical Aspects, Interrenal System / Laboratory Study

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Akhmerov, A.Kh. 1963.

Helminths as biological indicators of local stocks of Amur anadromous salmon (Oncorhynchus). -- Vopr. Ikhtiol. 3(3):536-555 (Fish. Res. Board Can. Transl. Ser. 1048).

Chum Salmon, Pink Salmon / Sea of Okhotsk / Stock Identification - Parasite Tags

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Akulin, V.N. 1966.

Changes in fatness of young sockeye as related to their downstream migration. -- Rybn. Khoz. 42(8):11-12 (Fish. Res. Board Can. Transl. Ser. 716).

Sockeye Salmon - Juvenile / Digestive System - Physiological and Biochemical Aspects (Stage of Migration)

8

Akulin, V.N. 1969.

Fatty acid composition of muscle phospholipids of sockeye salmon, Oncorhynchus nerka at various stages of its life cycle. -- J. Evol. Biochem. Physiol. 5:334-336.

Sockeye Salmon - Juvenile, Mature / Organ Systems (General), Seawater Adaptation, Freshwater Adaptation - Physiological and Biochemical Aspects / Laboratory Study

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Akulin, V.N. 1969.

Fatty acid composition of the phospholipids of the muscles and liver of the sockeye salmon (Oncorhynchus nerka (Walb.)) and of the zooplankton from Lake Dal'neye. -- Probl. Ichthyol. 9(6):880-887.

Sockeye Salmon - Mature, Juvenile / Inshore, River, Lake / Digestive System - Physiological and Biochemical Aspects (Stage of Migration) / Laboratory Study

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Akulin, V.N. 1969.

Fatty acid composition of muscle phospholipids of sockeye salmon (Oncorhynchus nerka), at various stages of its life cycle. -- Zh. Evol. Biokhim. Fiziol. 5(4):411-414 (Fish. Res. Board Can. Transl. Ser. 1471).

Sockeye Salmon - Juvenile, Mature / Organ Systems (General) - Physiological and Biochemical Aspects (Stage of Migration) / Seawater Adaptation / Laboratory Study

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Akulin, V.N., M.A. Chebotareva, and E.M. Kreps. 1969.

Fatty acids of phospholipids of the brain, muscles, and liver of the anadromous salmon, Oncorhynchus nerka in freshwater and marine conditions. -- J. Evol. Biochem. Physiol. 5:366.

Sockeye Salmon - Juvenile, Mature / Organ Systems (General), Seawater Adaptation, Freshwater Adaptation - Physiological and Biochemical Aspects / Laboratory Study

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River flow and upstream movement and catch of migratory salmonids. -- J. Fish Biol. 2:1-13.

Atlantic Salmon - Mature / River / Initiation of Upstream Migration, Termination of Migration - Water Level and Flow Rate, Influences (Miscellaneous) / Count

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Ali, M.A. 1958.

The ocular structure, retinomotor and photobehavioral responses of juvenile Pacific salmon. -- Ph.D. thesis. -- University of British Columbia, Vancouver, British Columbia. -- 172p.

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Pacific Salmon (General) / Visual System - Physiological and Biochemical Aspects

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The ocular structure, retinomotor and photobehavioral responses of juvenile Pacific salmon. -- Can. J. Zool. 37:965-996.

Pacific Salmon (General) - Alevin, Fry, Fingerling, Smolt / Visual System - Physiological and Biochemical Aspects / Initiation of Downstream Migration - Visual images / Voluntary Displacement / Laboratory Study

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Ali, M.A. 1960.
The effect of temperature on the juvenile sockeye salmon retina. -- Can. J. Zool. 38:169-171.

Sockeye Salmon - Fry / Visual System - Physiological and Biochemical Aspects (Water Temperature) / Laboratory Study

16

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The correlation of photobehavioral and retinomotor responses in the Pacific salmon. Pp.415-417 in B.C. Cristensen and B. Buchmann (ed.). Progress in photobiology. --Elsevier, Amsterdam, Netherlands.

Sockeye Salmon, Pink Salmon, Chum Salmon - Fry / Vertical Movement, Diel Timing, Voluntary Displacement / Initiation of Downstream Migration - Visual images

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Ali, M.A. 1962.
Influence of light intensity on retinal adaptation in Atlantic salmon (Salmo salar) yearlings. -- Can. J. Zool. 40:561-570.

Atlantic Salmon - Fingerling / Visual System - Physiological and Biochemical Aspects / Laboratory Study

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The role of vision in fish migration. Pp.12 in N. Kawamoto (convener). Physiological basis of fish migration in the Pacific area. -- Proc. Pac. Sci. Congr. 11(7).

Salmon (General) / Migration (General) - Visual images / Visual System - Physiological and Biochemical Aspects

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Retinal responses of pink salmon associated with its downstream migration. -- Nature 184:106-107.

Pink Salmon - Fry / Visual System - Physiological and Biochemical Aspects / Initiation of Downstream Migration - Visual images / Voluntary Displacement / Laboratory Study

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Ali, M.A., W.R. Stevenson, and J.S. Press. 1961. Histophysiological studies of the juvenile Atlantic salmon (*Salmo salar*) retina. -- Can. J. Zool. 39(2):123-128.

Atlantic Salmon - Fingerling / Visual System - Physiological and Biochemical Aspects / Laboratory Study

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Allan, I.R.H., and M.J. Bulleid. 1963. Long distance migration of Atlantic salmon. -- Nature 200:89.

Atlantic Salmon - Immature / Southern Europe, Greenland / Route / Tagging

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Allen, G.H. 1956. Migration distribution, and movement of Puget Sound silver salmon. -- Ph.D. thesis. -- University of Washington, Seattle, Washington. -- 322p.

Coho Salmon - Immature, Mature / Chinook Salmon - Mature / Washington / Inshore / Route / Marking / Initiation of Stream Entry - Weather / Homing

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Coho Salmon, Chinook Salmon - Mature / Washington / River / Seasonal Timing, Initiation of Stream Entry - Weather, Water Temperature / Diel Timing

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Coho Salmon - Immature, Mature / Washington, Oregon, California, Southern British Columbia / Inshore / Seasonal Timing, Route, Speed of Migration / Marking

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Allen, G.H. 1967. Contribution of Puget Sound coho salmon, *Oncorhynchus kisutch*, to the 1953 Pacific coast commercial troll fishery. -- Trans. Am. Fish. Soc. 96(1):42-54.

Coho Salmon - Mature / Washington, Southern British Columbia / Inshore / Route, Speed of Migration, Seasonal Timing / Marking

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Allen, G.H., J. Miyamoto, and W. Harper. 1978.
Rate of straying in adult coho (silver) salmon (Oncorhynchus kisutch) from smolts released at an intertidal location. -- Calif. Coop. Fish. Res. Unit. Res. Rep. Ser. 78-1:44p.

Coho Salmon - Mature / California / Straying / Marking

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Allen, K.R. 1944.
Studies on the biology of the early stages of salmon (Salmo salar). 4. The smolt migration in the Thurso River in 1938. -- J. Anim. Ecol. 13:63-85.

Atlantic Salmon - Smolt / Southern Europe / River / Seasonal Timing, Initiation of Downstream Migration - Water Level and Flow Rate, Water Temperature, Weather, Light Intensity / Smoltification - Size and Growth / Speed of Migration / Count, Tagging, Marking

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Results of Atlantic salmon tagging in the Maritime provinces of Canada, 1964-66. -- Int. Comm. Northwest Atl. Fish. Redbook 1967(3):69-73.

Atlantic Salmon - Immature / Atlantic Canada and United States, Greenland / Route - Size and Growth / Tagging

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Alm, G. 1934.
Salmon in the Baltic precincts. -- Rapp. P.-V. Reun. Cons. Int. Explor. Mer 92:1-63.

Atlantic Salmon - Immature, Mature / Iceland and Northern Europe / River, Inshore / Seasonal Timing / Route, Horizontal Distribution (Geographic) / Tagging

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Seasonal fluctuations in the catches of salmon in the Baltic. -- J. Cons. Cons. Int. Explor. Mer 23:399-433.

Atlantic Salmon - Adult / Iceland and Northern Europe / Inshore / Seasonal Timing / Capture

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Migrations of silver salmon in Puget Sound. -- Wash. Dep. Fish. Fish. Res. Pap. 1(1):13-21.

Coho Salmon - Mature / Washington / Inshore, River / Route, Speed of Migration / Tagging

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Use of a discriminant function in the morphological separation of pink salmon, Oncorhynchus gorbuscha (Walbaum). -- Int. North Pac. Fish. Comm. Bull. 11:73-85.

Pink Salmon - Adult / Pacific Ocean (General) / Open Ocean / Route / Stock Identification - Scale Analysis, Morphometrics and Meristics

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Anas, R.E., and J.R. Gauley. 1956.
Blueback salmon, Oncorhynchus nerka age and length at seaward migration past Bonneville Dam. -- U.S. Fish Wildl. Serv. Spec. Sci. Rep. Fish. 185:46p.

Sockeye Salmon - Juvenile / Washington, Oregon / River, Artificial Obstruction / Seasonal Timing, Speed of Migration / Marking, Count

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Anas, R.E., and S. Murai. 1969.
Use of scale characters and a discriminant function for classifying sockeye salmon (Oncorhynchus nerka) by continent of origin. -- Int. North Pac. Fish. Comm. Bull. 26:157-192.

Sockeye Salmon / Pacific Ocean (General) / Stock Identification - Scale Analysis

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Andrew, F.J., and G.H. Geen. 1960.
Sockeye and pink salmon production in relation to proposed dams in the Fraser River system. -- Int. Pac. Salmon Fish. Comm. Bull. 11:259p.

Pacific Salmon (General) - Mature, Juvenile / Southern British Columbia / River / Migration (General) - Obstruction

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Andrew, F.J., L.R. Kersey, and P.C. Johnson. 1955.
An investigation of the problem of guiding downstream - migrant salmon at dams. -- Int. Pac. Salmon Fish. Comm. Bull. 8:65p.

Pacific Salmon (General) - Juvenile / Artificial Obstruction / Guiding

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Andrews, C.W. 1943.
Smolt marking on the North River, Petitcodiac, N.B. (Atlantic salmon and trout investigations, 1943. Vol.28). -- Fish. Res. Board Can. Manuscr. Rep. Biol. Stn. 335(1):9p.

Atlantic Salmon - Smolt / Atlantic Canada and United States / River / Seasonal Timing, Initiation of Downstream Migration - Water Level and Flow Rate, Water Temperature / Count

38

Andrews, C.W. 1944.
Report on salmon trap operation, Pollett River, 1944. (Atlantic salmon and trout investigations, 1944. Vol.30). -- Fish. Res. Board Can. Manuscr. Rep. Biol. Stn. 373(3):12p.

Atlantic Salmon - Smolt / Atlantic Canada and United States / River / Seasonal Timing, Initiation of Downstream Migration - Water Temperature, Water Level and Flow Rate / Pattern / Speed of Migration - Reservoirs and Impoundments / Count

39

Andrews, C.W. 1945.
Report on smolt trap operation, Pollett River, 1945. (Atlantic salmon and trout investigations, 1945. Vol.33). -- Fish. Res. Board Can. Manuscr. Rep. Biol. Stn. 381(4):9p.

Atlantic Salmon - Smolt / Atlantic Canada and United States / River / Seasonal Timing - Water Level and Flow Rate / Count

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Report of Pollett River smolt trap operation, 1947. -- Fish. Res. Board Can. Manuscr. Rep. Biol. Stn. 365:4p.

Atlantic Salmon - Smolt / Atlantic Canada and United States / River / Seasonal Timing / Count

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Return of salmon to home streams. -- Pac. Fisherman 35(10):31; 35(11):38.

Pacific Salmon (General) / Homing

42

Anon. 1962.
Long distance migrations by salmon. -- Scott. Fish. Bull. 17:25.

Atlantic Salmon - Adult / Southern Europe, Greenland / Route / Tagging

43

Anon. 1968.
Computer analysis of salmon migration. -- Nature 218:216-217.

Atlantic Salmon - Mature / River / Migration (General)

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Anon. 1969.
Report of the ICES/ICNAF joint working party on North Atlantic salmon. -- Int. Counc. Explor. Sea Coop. Res. Rep. Ser. A 12:18p.

Atlantic Salmon / Migration (General)

45

Anon. 1970.
Third report of the ICES/ICNAF joint working party on North Atlantic salmon. -- Int. Counc. Explor. Sea Coop. Res. Rep. Ser. A 24:36p.

Atlantic Salmon / Migration (General)

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Anon. 1973.
Fourth report of the ICES/ICNAF joint working party on North Atlantic salmon. -- Int. Counc. Explor. Sea Coop. Res. Rep. Ser. A 35:37p.

Atlantic Salmon / Migration (General)

47

Anon. 1973.
Hydromechanics of fish migration. -- Nature 245:7.

Salmon (General) - Mature / Energetics, Speed of Migration / Locomotory System - Physiological and Biochemical Aspects

48

Anon. 1981.
Reports of the ICES working group on North Atlantic salmon, 1979 and 1980. -- Int. Counc. Explor. Sea Coop. Res. Rep. 104:46p.

Atlantic Salmon / Migration (General)

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Armour, C.L. 1974.
Serum antigenic differences in spring chinook salmon (*Oncorhynchus tshawytscha*) from two separate rivers. -- Trans. Am. Fish. Soc. 103(2):379-382.

Chinook Salmon - Mature, Juvenile / River / Stock Identification - Electrophoresis and Serology

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Atlantic Salmon / Marking

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Sockeye Salmon / Central Alaska / Stock Identification - Scale Analysis

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Sockeye Salmon / Central Alaska / Stock Identification - Scale Analysis

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Sockeye Salmon, Pink Salmon - Mature / Central Alaska / River / Seasonal Timing

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Sockeye Salmon, Pink Salmon - Mature / Central Alaska / River / Seasonal Timing

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Sockeye Salmon, Pink Salmon - Mature / Central Alaska / River / Seasonal Timing

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Sockeye Salmon, Pink Salmon - Mature / Central Alaska / River / Seasonal Timing

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Sockeye Salmon, Pink Salmon - Mature / Central Alaska / River / Seasonal Timing

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Sockeye Salmon, Pink Salmon - Mature / Central Alaska / River / Seasonal Timing

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Pink Salmon - Mature / Central Alaska / Inshore, River / Seasonal Timing

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Atlantic Salmon / Atlantic Canada and United States / Migration (General)

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Atlantic Salmon / Atlantic Canada and United States / Migration (General)

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Pink Salmon / Northern British Columbia, Southern British Columbia, Southeastern Alaska, Central Alaska, Western Alaska / Stock Identification - Scale Analysis

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Atlantic Salmon / Southern Europe

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Atlantic Salmon / Migration (General)

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Sockeye Salmon - Fry / Western Alaska / River, Lake / Pattern

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Chinook Salmon - Juvenile / Guiding

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Salmon (General) - Juvenile / Guiding

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Sockeye Salmon / Stock Identification - Biogeochemical Analysis

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Atlantic Salmon - Kelt / Southern Europe / River, Inshore / Route / Marking

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Atlantic Salmon - Mature, Adult / Southern Europe / Inshore / Route, Speed of Migration / Marking

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Atlantic Salmon - Adult / Southern Europe / Inshore / Route, Speed of Migration / Marking

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Atlantic Salmon / Homing

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Atlantic Salmon - Immature / Iceland and Northern Europe / Inshore / Route, Horizontal Distribution (Geographic) / Tagging

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Atlantic Salmon - Mature / Iceland and Northern Europe / Inshore / Route, Homing / Tagging

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Atlantic Salmon / Iceland and Northern Europe / Inshore / Tagging

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Sockeye Salmon - Smolt / Western Alaska / River / Seasonal Timing, Diel Timing / Count

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Sockeye Salmon - Mature / Inshore / Route / Tagging

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Pacific Salmon (General) / Migration (General)

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Pacific Salmon (General) / Migration (General)

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Sockeye Salmon - Mature / Northern British Columbia / River / Seasonal Timing - Age

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Sockeye Salmon - Fry / Northern British Columbia / Tributary / Seasonal Timing / Count

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Coho Salmon - Smolt / Smoltification - Osmoregulatory and Excretory System, (Physiological and Biochemical Aspects)

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Salmon (General) / Artificial Obstruction / Guiding

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Chum Salmon, Chinook Salmon - Fry / Washington / Estuary / Seasonal Timing, Pattern

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Steelhead Trout - Juvenile / Seawater Adaptation, Osmoregulatory and Excretory System - Physiological and Biochemical Aspects / Thyroid System - Physiological and Biochemical Aspects (Stage of Migration) / Laboratory Study

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Sockeye Salmon / Eastern Kamchatka to Chuchuki Peninsula, Western Alaska / Stock Identification - Scale Analysis

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Chum Salmon, Coho Salmon - Alevin

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Sockeye Salmon, Chinook Salmon, Coho Salmon, Chum Salmon - Mature / Homing

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Sockeye Salmon - Fingerling / Vertical Distribution, Preference - Water Temperature / Laboratory Study

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Coho Salmon - Smolt / Central Alaska / River, Lake / Diel Timing / Seasonal Timing, Initiation of Downstream Migration - Water Temperature

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Atlantic Salmon - Mature / Migration (General)

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Chum Salmon, Sockeye Salmon - Adult / California / Inshore / Horizontal Distribution (Geographic)

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Atlantic Salmon / Greenland / Direction Finding (General), Migration (General)

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Pink Salmon - Adult / Sea of Okhotsk / Inshore / Route

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Pink Salmon - Mature / Chum Salmon - Fry, Immature, Mature / Masu Salmon - Mature / Sea of Okhotsk / Inshore, River, Estuary / Direction, Route - Population Density / Skeletal and Integumentary System - Morphological Aspects (Stage of Migration) / Initiation of Stream Entry - Weather, Influences (Miscellaneous), Salinity / Seasonal Timing, Pattern / Marking, Capture / Stock Identification - Morphometrics and Meristics

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Pink Salmon - Fry / Sea of Okhotsk / River / Migration (General), Diel Timing

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Chum Salmon, Pink Salmon / Arctic North America / Eastern Arctic Russia / Horizontal Distribution (Geographic)

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Sockeye Salmon, Coho Salmon - Smolt / Initiation of Downstream Migration, Smoltification - Thyroid System / Laboratory Study

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Steelhead Trout - Juvenile / Thyroid System - Physiological and Biochemical Aspects (Time of Year)

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Atlantic Salmon - Fingerling, Smolt / Smoltification - Thyroid System / Laboratory Study

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Chum Salmon, Coho Salmon - Mature / Washington / Inshore / Route, Seasonal Timing / Tagging

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Adaptation, Migration (General) / Laboratory Study

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Pacific Salmon (General) - Adult / Guiding

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Pacific Salmon (General) - Juvenile / Guiding

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Pacific Salmon (General) - Juvenile / Guiding

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Chinook Salmon - Adult / California / Inshore / Horizontal Distribution (Geographic)

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Organ Systems (General) - Physiological and Biochemical Aspects (Stage of Migration) / Freshwater Adaptation / Laboratory Study

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Sockeye Salmon - Mature / Southern British Columbia / River / Organ Systems (General) - Physiological and Biochemical Aspects (Stage of Migration) / Laboratory Study

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Sockeye Salmon - Mature / Southern British Columbia / Inshore / Route, Pattern / Marking

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Sockeye Salmon - Landlocked / Migration (General)

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Pacific Salmon (General) / Southern British Columbia, Northern British Columbia / Migration (General)

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Sockeye Salmon / Pacific Ocean (General) / Migration (General)

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Atlantic Salmon / Iceland and Northern Europe / Tagging

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Atlantic Salmon - Adult / Greenland, Atlantic Ocean (General) / Route / Tagging

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Salmon (General) / Olfactory System - Physiological and Biochemical Aspects

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Salmon (General) / Homing

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Salmon (General) / Homing

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Atlantic Salmon - Kelt / Atlantic Canada and United States / River, Estuary, Inshore / Route / Tagging

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Atlantic Salmon / Atlantic Canada and United States / Homing, Migration (General)

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Atlantic Salmon - Juvenile, Adult / Migration (General)

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Atlantic Salmon / Homing

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Atlantic Salmon / Migration (General)

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Atlantic Salmon / Migration (General)

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Atlantic Salmon / Migration (General) - Endocrine System (General)

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Sockeye Salmon - Mature / Southern British Columbia / Inshore, River, Tributary / Freshwater Adaptation / Digestive system, Organ Systems (General) - Physiological and Biochemical Aspects (Stage of Migration) / Energetics / Laboratory Study

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Sockeye Salmon - Mature / Southern British Columbia / Inshore, River, Tributary / Organ Systems (General) - Physiological and Biochemical Aspects (Stage of Migration) / Energetics, Freshwater Adaptation / Laboratory Study

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Sockeye Salmon / Tagging

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Chum Salmon - Mature / Japan / Estuary, River / Digestive system - Physiological and Biochemical Aspects (Stage of Migration) / Laboratory Study

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Chum Salmon - Fry, Immature / Japan / Inshore, Estuary / Route, Pattern, Seasonal Timing / Marking

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Pink Salmon - Mature / Northern British Columbia, Southern British Columbia, Washington / Inshore / Route / Tagging

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Chum Salmon, Pink Salmon - Immature / Japan / Inshore / Pattern, Route, Schooling / Capture

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Masu Salmon - Juvenile / Japan / River / Pattern, Seasonal Timing / Marking

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Pink Salmon - Mature / Japan, Sea of Okhotsk, Eastern Kamchatka to Chuchuki Peninsula / Inshore, River / Seasonal Timing

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Pink Salmon - Adult / Pacific Ocean (General) / Inshore, Open Ocean / Horizontal Distribution (Geographic) / Capture / Stock Identification - Scale Analysis

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Sockeye Salmon - Immature / Western Pacific Ocean / Open Ocean / Route / Stock Identification - Scale Analysis

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Salmon (General) / Smoltification

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Chinook Salmon - Mature / California / Inshore / Migration (General)

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Pink Salmon - Adult / Washington / Inshore / Route, Seasonal Timing / Tagging

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Atlantic Salmon - Immature / Eastern North Atlantic / Open Ocean / Horizontal Distribution (Geographic) / Capture

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Atlantic Salmon - Immature, Mature / Atlantic Canada and United States / Inshore / Route, Seasonal Timing / Tagging

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Coho Salmon - Mature / Great Lakes / River / Taxis - Current (Odours) / Direction Finding (General), Pattern - Odours

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Coho Salmon - Mature / Great Lakes / River / Direction Finding (General), Direction, Pattern - Odours / Taxis - Current

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Pacific Salmon (General) - Juvenile / Guiding

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Sockeye Salmon - Juvenile / Northern British Columbia / Lake / Pattern

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Atlantic Salmon - Smolt / Smoltification, Skeletal and Integumentary System - Morphological Aspects, Physiological and Biochemical Aspects (Photoperiod, Water Temperature, Size and Growth)

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Sockeye Salmon - Mature / Lake, River / Direction Finding (General), Migration (General)

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Pink Salmon - Mature, Immature / Sea of Japan, Sea of Okhotsk, Bering Sea, Eastern Kamchatka to Chuchuki Peninsula / Inshore, Open Ocean, Estuary, River / Horizontal Distribution (Geographic) - Water Temperature / Route, Straying, Speed of Migration / Seasonal Timing / Initiation of Stream Entry - Water Level and Flow Rate, Water Temperature

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Atlantic Salmon - Mature / Iceland and Northern Europe / River, Artificial Obstruction / Seasonal Timing, Initiation of Upstream Migration - Current, Water Temperature / Diel Timing

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Pink Salmon - Adult / Sea of Japan / Inshore / Route / Stock Identification - Scale Analysis

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Chum Salmon / Pacific Ocean / Stock Identification - Scale Analysis

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Sockeye Salmon - Smolt / Western Alaska / River / Seasonal Timing, Diel Timing / Count

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Steelhead Trout - Smolt / California / Smoltification - Physiological and Biochemical Aspects

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Atlantic Salmon - Immature / Atlantic Canada and United States, Greenland / Route / Tagging

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Steelhead Trout - Smolt / California / River / Seasonal Timing / Speed of Migration - Age

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Atlantic Salmon - Mature / River / Migration (General)

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Salmon (General) / Migration (General)

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Chum Salmon - Mature / Sea of Japan / River / Seasonal Timing

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Sockeye Salmon - Juvenile, Mature / River / Freshwater Adaptation, Digestive system - Physiological and Biochemical Aspects / Energetics / Initiation of Downstream Migration - Influences (Miscellaneous)

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Salmon (General) / Direction Finding (General) - Odours / Olfactory system - Physiological and Biochemical Aspects

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Atlantic Salmon - Fingerling, Smolt / Osmoregulatory and Excretory System, Smoltification - Physiological and Biochemical Aspects / Laboratory Study

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Chum Salmon / Sea of Okhotsk / Stock Identification - Morphometrics and Meristics

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Atlantic Salmon - Fingerling, Smolt / Seawater Adaptation, Smoltification - Size and Growth, Photoperiod, Water Temperature / Laboratory Study

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Masu Salmon - Smolt / Osmoregulatory and Excretory System - Physiological and Biochemical Aspects / Seawater Adaptation / Laboratory Study

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Pacific Salmon (General) / Smoltification, Osmoregulatory and Excretory System - Physiological and Biochemical Aspects / Laboratory Study

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Chum Salmon - Fry / Japan / River / Diel Timing

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Chum Salmon - Fry / Japan / River / Taxis - Current / Voluntary Displacement, Schooling / Initiation of Downstream Migration - Light Intensity, Turbidity, Dissolved Gas Concentration, Water Temperature, Water Level and Flow Rate

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Pink Salmon - Fry / Japan / Tributary / Seasonal Timing, Voluntary Displacement

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Chum Salmon - Immature / Japan / Inshore / Route / Marking

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Pink Salmon, Chum Salmon - Fry / Japan / River / Speed of Migration / Marking

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Ecological observations on the salmon of Nishibetsu River: II. Movements, growth and feeding habits of pink salmon fry, Oncorhynchus gorbuscha (Walbaum), during seaward migration. -- Sci. Rep. Hokkaido Salmon Hatchery 20:1-10 (Fish. Res. Board Can. Transl. Ser. 785).

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Atlantic Salmon - Mature / Iceland and Northern Europe / River / Pattern, Behaviour - Current / Sonic or Radio Tracking

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Sockeye Salmon, Pink Salmon / Pacific Ocean (General) / Stock Identification - Parasite Tags

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Sockeye Salmon - Adult / Pacific Ocean (General) / Open Ocean, Inshore / Route / Horizontal Distribution (Geographic) - Time of Year / Stock Identification - Parasite Tags

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Sockeye Salmon / Pacific Ocean (General) / Stock Identification - Parasite Tags

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Sockeye Salmon / Pacific Ocean (General) / Stock Identification - Parasite Tags

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Sockeye Salmon - Adult / Pacific Ocean (General) / Open Ocean / Route / Stock Identification - Parasite Tags

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Sockeye Salmon / Pacific Ocean (General) / Stock Identification - Parasite Tags

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Coho Salmon - Smolt / Seawater Adaptation, Osmoregulatory and Excretory System - Physiological and Biochemical Aspects

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Coho Salmon - Fingerling, Smolt / Southern British Columbia / Smoltification, Skeletal and Integumentary System

- Morphological Aspects, Physiological and Biochemical Aspects / Laboratory Study

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Sockeye Salmon - Smolt / Western Alaska / Lake, River / Seasonal Timing, Diel Timing / Count

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Sockeye Salmon - Smolt / Western Alaska / River, Lake / Seasonal Timing / Count

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Sockeye Salmon - Fingerling, Smolt, Adult / Olfactory system - Morphological Aspects (Age)

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Sockeye Salmon - Juvenile / Osmoregulatory and Excretory System, Seawater Adaptation - Physiological and Biochemical Aspects / Laboratory Study

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Sockeye Salmon, Coho Salmon - Fingerling / Southern British Columbia / Lake / Pattern / Capture

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Coho Salmon - Fry, Mature / Sockeye Salmon - Smolt, Fry / Southern British Columbia / River / Seasonal Timing, Initiation of Downstream Migration - Tide / Voluntary Displacement / Initiation of Downstream Migration - Population Density / Non Migratory Movements / Count

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Coho Salmon - Alevin / Taxis - Light Intensity, Current / Direction, Diel Timing, Behaviour / Laboratory Study

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Steelhead Trout, Atlantic Salmon / Horizontal Distribution (Geographic) - Water Temperature

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Chinook Salmon - Immature, Mature / Pacific Ocean (General) / Open Ocean / Horizontal Distribution (Geographic), Route / Capture, Tagging

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Sockeye Salmon - Mature / Western Alaska / Estuary / Pattern / Tagging

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Sockeye Salmon - Mature / Western Alaska / River / Seasonal Timing

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Atlantic Salmon - Immature, Mature / Iceland and Northern Europe / Inshore, Open Ocean / Route - Current

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Sockeye Salmon - Mature / Western Alaska / River / Seasonal Timing, Speed of Migration / Tagging

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Chum Salmon - Mature / Oregon / River / Seasonal Timing

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Pink Salmon - Mature / River / Endocrine System (General) - Physiological and Biochemical Aspects (Stage of Migration) / Laboratory Study

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Atlantic Salmon - Mature / Migration (General)

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Atlantic Salmon - Immature, Mature / Western North Atlantic, Atlantic Canada and United States, Greenland / Inshore, Open Ocean / Route, Horizontal Distribution (Geographic) / Tagging

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Chum Salmon - Mature / Japan / River / Initiation of Upstream Migration, Diel Timing - Light Intensity, Turbidity, Water Level and Flow Rate, Population Density

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Chum Salmon - Immature / Japan / Estuary, Inshore / Pattern, Route / Marking

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Salmon (General) - Juvenile / Guiding

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Atlantic Salmon - Adult / Iceland and Northern Europe, Southern Europe / Route / Tagging

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Atlantic Salmon - Mature / Natural Obstruction / Behaviour

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Sockeye Salmon / Pacific Ocean (General) / Stock Identification - Scale Analysis

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Chum Salmon - Mature / Pituitary system - Morphological Aspects / Laboratory Study

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Sockeye Salmon - Juvenile / Northern British Columbia / Lake / Vertical Movement - Time of Year, Food Availability / Capture, Hydroacoustics

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Steelhead Trout / Migration (General) - Genetic Aspects

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Coho Salmon, Chinook Salmon - Immature, Mature / Inshore / Route / Tagging

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Pacific Salmon (General) / Migration (General)

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Sockeye Salmon - Smolt / Western Alaska / Lake, River / Seasonal Timing, Initiation of Downstream Migration, Termination of Migration - Water Temperature / Count

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Sockeye Salmon - Smolt / Western Alaska / River, Lake / Seasonal Timing / Count

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Coho Salmon - Fingerling / Guiding

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Pink Salmon / Central Alaska / Stock Identification - Morphometrics and Meristics, Electrophoresis and Serology

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Masu Salmon - Smolt / Smoltification - Physiological and Biochemical Aspects (Thyroid system)

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Chum Salmon - Mature / Japan / River / Speed of Migration / Tagging

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Chum Salmon - Mature / Japan / River / Circulatory system - Physiological and Biochemical Aspects (Stage of Migration) / Freshwater Adaptation / Laboratory Study

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Chum Salmon - Mature / Japan / River / Circulatory system - Physiological and Biochemical Aspects (Stage of Migration) / Freshwater Adaptation / Laboratory Study

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Chum Salmon - Mature / Japan / River / Organ Systems (General) - Physiological and Biochemical Aspects / Freshwater Adaptation / Laboratory Study

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Chum Salmon - Mature / Japan / River / Speed of Migration - Time of Year / Tagging

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Coho Salmon - Smolt / Smoltification, Pituitary system, Thyroid system, Interrenal system, Ultimobranchial system, Endocrine System (General) - Morphological Aspects, Physiological and Biochemical Aspects

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Sockeye Salmon - Mature / Bering Sea, Western Alaska / Open Ocean, Inshore / Energetics

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Chum Salmon - Immature, Mature / Bering Sea / Open Ocean / Horizontal Distribution (Geographic) - Age / Capture

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Salmon (General) - Mature / River / Direction Finding (General) - Pheromones

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Salmon (General) - Mature / Inshore, River / Direction Finding (General) - Pheromones

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Atlantic Salmon - Mature / Iceland and Northern Europe / River

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Atlantic Salmon - Mature / Iceland and Northern Europe / River / Seasonal Timing

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Steelhead Trout, Chinook Salmon - Smolt / Smoltification, Initiation of Downstream Migration - Thyroid system

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Steelhead Trout - Juvenile / Taxis - Current (Photoperiod) / Laboratory Study

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Steelhead Trout - Juvenile / Southern British Columbia / Tributary / Direction, Pattern - Water Temperature / Taxis - Current (Water Temperature) / Initiation of Downstream Migration - Water Temperature, Photoperiod / Voluntary Displacement, Behaviour, Seasonal Timing, Diel Timing / Count

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Steelhead Trout - Juvenile / Southern British Columbia / Tributary / Seasonal Timing, Diel Timing / Direction - Water Temperature, Photoperiod, Genetic Aspects

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Sockeye Salmon - Landlocked / Southern British Columbia / Lake / Vertical Movement - Time of Year / Hydroacoustics, Capture

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Atlantic Salmon / Stock Identification - Electrophoresis and Serology

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Sockeye Salmon - Mature / Oregon / River / Straying

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Sockeye Salmon - Adult / Western Pacific Ocean, Bering Sea / Open Ocean / Seasonal Timing, Route / Capture

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Sockeye Salmon - Immature / Western Alaska / Inshore, Open Ocean / Horizontal Distribution (Geographic) - Water Temperature, Salinity, Size and Growth / Seasonal Timing - Size and Growth / Capture

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Chinook Salmon - Adult / Northern British Columbia / Inshore / Route, Seasonal Timing / Tagging, Capture

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Chum Salmon - Mature / Japan / River / Seasonal Timing - Genetic Aspects

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Chum Salmon - Immature, Mature / Japan, Sea of Okhotsk / Inshore, Open Ocean / Route / Stock Identification - Electrophoresis and Serology

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Atlantic Salmon - Smolt / Endocrine System (General), Osmoregulatory and Excretory System, Smoltification - Physiological and Biochemical Aspects

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Atlantic Salmon - Smolt / Seawater Adaptation / Interrenal system - Morphological Aspects

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Atlantic Salmon - Smolt / Southern Europe / River / Migration (General)

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Sockeye Salmon, Pink Salmon - Mature / Central Alaska / River / Seasonal Timing

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Atlantic Salmon - Immature, Mature, Kelt / Greenland, Atlantic Canada and United States / Route, Seasonal Timing - Age / Tagging

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Atlantic Salmon - Alevin / Preference - Water Temperature

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Salmon (General) / Migration (General) - Interrenal system

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Atlantic Salmon - Mature / Atlantic Canada and United States / Inshore / Route, Speed of Migration / Tagging

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Atlantic Salmon / Atlantic Ocean (General) / Stock Identification - Parasite Tags

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Atlantic Salmon / Southern Europe / Stock Identification - Parasite Tags

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Atlantic Salmon / Atlantic Ocean (General) / Stock Identification - Parasite Tags

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Chum Salmon - Mature / Sea of Okhotsk / River / Pituitary system - Morphological Aspects (Stage of Migration) / Laboratory Study

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Atlantic Salmon - Mature / Western Arctic Russia / River, Artificial Obstruction, Reservoir or Impoundment / Pattern - Sound, Time of Day / Speed of Migration - Current

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Salmon (General) / Homing, Direction Finding (General) - Odours / Orientation - Celestial Cues, Electric Fields, Magnetic Field / Taxis - Current

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Sockeye Salmon - Mature / River / Route

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Pink Salmon - Mature / Interrenal system - Morphological Aspects (Stage of Migration)

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Atlantic Salmon / Homing

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Atlantic Salmon / Homing

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Atlantic Salmon / Atlantic Canada and United States / Migration (General)

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Atlantic Salmon - Adult / Atlantic Canada and United States / Inshore / Route / Stock Identification - Scale Analysis

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Pacific Salmon (General) - Mature / Inshore, Open Ocean, River / Route - Current / Direction Finding (General) - Salinity, Dissolved Gas Concentration / Homing

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Salmon (General) / Direction Finding (General) - Dissolved Gas Concentration / Migration (General)

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Salmon (General) - Adult / Inshore, Open Ocean / Direction Finding (General) - Dissolved Gas Concentration

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Salmon (General) / Direction Finding (General) - Dissolved Gas Concentration

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Pacific Salmon (General) / Migration (General)

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Pacific Salmon (General) / Arctic North America / Horizontal Distribution (Geographic)

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Salmon (General) / Migration (General) - Evolution

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Chum Salmon, Pink Salmon - Mature / Southern British Columbia, Washington / Inshore / Route / Tagging

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Chum Salmon, Pink Salmon - Mature / Southern British Columbia, Northern British Columbia, Washington / Inshore / Route, Speed of Migration / Tagging

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Chinook Salmon, Coho Salmon, Pink Salmon, Sockeye Salmon - Mature / Southern British Columbia, Northern British Columbia / Inshore / Route / Tagging

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Chum Salmon, Chinook Salmon, Coho Salmon, Pink Salmon, Sockeye Salmon - Adult / Southern British Columbia, Northern British Columbia / Inshore / Route / Tagging

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Coho Salmon - Adult / Southern British Columbia, Northern British Columbia, Southeastern Alaska, Washington / Route, Speed of Migration / Tagging

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Chinook Salmon - Mature / Southern British Columbia, Northern British Columbia, Southeastern Alaska, Washington, Oregon / Inshore / Route / Speed of Migration / Tagging

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Pink Salmon - Mature / Northern British Columbia / Estuary, River / Pattern / Seasonal Timing, Initiation of Stream Entry - Water Level and Flow Rate / Count

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Pink Salmon - Mature / Northern British Columbia / River, Estuary / Initiation of Stream Entry - Water Level and Flow Rate / Seasonal Timing - Size and Growth / Count

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Pink Salmon - Mature / Southern British Columbia, Northern British Columbia / Homing, Straying / Marking

1293

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Physical characteristics and behaviour of pink salmon fry at McClinton Creek, B.C. -- J. Fish. Res. Board Can. 6(3):217-227.

Pink Salmon - Fry / Northern British Columbia / River / Speed of Migration, Behaviour, Diel Timing, Seasonal Timing / Initiation of Downstream Migration - Water Level and Flow Rate, Light Intensity / Count

1294

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Sockeye Salmon - Mature / Northern British Columbia / Lake, River / Speed of Migration - Time of Year / Seasonal Timing / Count, Tagging

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Pacific Salmon (General) / Homing

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Pacific Salmon (General) / Stock Identification - Electrophoresis and Serology

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Atlantic Salmon - Mature / River / Migration (General)

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Atlantic Salmon - Mature / Southern Europe / River

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Coho Salmon - Fry, Fingerling / Behaviour - Current / Initiation of Downstream Migration - Water Temperature, Current / Direction

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Atlantic Salmon - Smolt / Smoltification - Morphological Aspects, Physiological and Biochemical Aspects, Size and Growth / Osmoregulatory and Excretory System, Seawater Adaptation - Physiological and Biochemical Aspects / Seasonal Timing, Diel Timing, Behaviour / Initiation of Downstream Migration - Water Temperature, Light Intensity, Influences (Miscellaneous) / Taxis - Current / Migration (General) - Obstruction, Reservoirs and Impoundments

1384

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Pacific Salmon (General) - Juvenile / Guiding

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Chum Salmon - Fry / Sea of Okhotsk / River / Seasonal Timing, Speed of Migration, Schooling, Diel Timing / Initiation of Downstream Migration - Water Level and Flow Rate / Count

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Pink Salmon - Adult / Sea of Okhotsk, Sea of Japan / Route / Marking

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Salmon (General) - Mature / Homing

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Sockeye Salmon - Smolt, Juvenile, Mature / Central Alaska / River, Lake / Seasonal Timing - Age, Size and Growth / Vertical Distribution - Time of Day / Vertical Movement / Hydroacoustics / Count

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Chinook Salmon - Alevin, Fry, Juvenile, Mature / California / River, Estuary / Behaviour, Schooling, Pattern, Diel Timing, Homing, Speed of Migration / Seasonal Timing, Initiation of Downstream Migration - Turbidity, Water Level and Flow Rate / Initiation of Upstream Migration - Weather / Route - Time of Year / Organ Systems (General), Skeletal and Integumentary System, Digestive system - Morphological Aspects (Stage of Migration) / Count

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Chum Salmon - Fry, Immature / Seawater Adaptation - Physiological and Biochemical Aspects / Digestive system - Physiological and Biochemical Aspects (Stage of Migration) / Energetics / Laboratory Study

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Salmon (General) - Mature / Direction Finding (General), Speed of Migration, Energetics, Random Movement, Homing, Migration (General) / Initiation of Homing Migration - Endocrine System (General), Pituitary system / Modelling

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Pink Salmon, Chum Salmon - Adult / Sea of Okhotsk / Open Ocean / Direction, Pattern / Capture

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Pacific Salmon (General) / Marking

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Atlantic Salmon - Adult / Iceland and Northern Europe / Inshore / Route

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Atlantic Salmon - Adult / Iceland and Northern Europe / Inshore / Route

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Chum Salmon - Mature / Japan / Homing

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Pink Salmon, Masu Salmon, Sockeye Salmon, Coho Salmon, Chinook Salmon / Japan / Migration (General)

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Chum Salmon - Mature / Sea of Okhotsk, Eastern Kamchatka to Chuchuki Peninsula, Japan / Inshore, River / Seasonal Timing

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Masu Salmon - Immature / Japan / Inshore, Estuary / Pattern

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Chum Salmon - Fry / Japan / River / Seasonal Timing - Water Temperature

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Chum Salmon - Immature / Japan / Inshore / Route / Marking

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Chinook Salmon - Juvenile / California / River, Estuary / Seasonal Timing

1404

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Sockeye Salmon - Mature / Eastern Kamchatka to Chuchuki Peninsula / Inshore / Route / Tagging

1405

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On new migratory courses of salmon cleared by the tagging experiments in the fishing ground of northern North Pacific, 1936. III. *Oncorhynchus gorbuscha* (Walb.). -- Bull. Jap. Soc. Sci. Fish. 6(6):299-304.

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Pink Salmon - Mature / Eastern Kamchatka to Chuchuki Peninsula, Sea of Okhotsk / Inshore, Open Ocean / Route / Tagging

1406

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Chum Salmon - Mature / Sea of Okhotsk, Eastern Kamchatka to Chuchuki Peninsula / Inshore, Open Ocean / Route / Tagging

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Sockeye Salmon - Adult / Sea of Okhotsk / Open Ocean / Speed of Migration / Tagging

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Pacific Salmon (General) / Eastern Kamchatka to Chuchuki Peninsula, Sea of Okhotsk / Tagging

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Chum Salmon - Mature / Direction Finding (General) - Odours

1410

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Chum Salmon / Pacific Ocean (General) / Stock Identification - Scale Analysis

1411

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Chum Salmon - Mature / Japan / Estuary / Speed of Migration, Route, Pattern / Tagging

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Chum Salmon - Mature / Japan / Inshore, Estuary, River / Route, Homing / Tagging

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Atlantic Salmon - Mature / Atlantic Canada and United States / River / Seasonal Timing, Reverse Migration, Route - Pollutants / Count, Tagging

1414

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Atlantic Salmon - Fingerling, Smolt, Mature / Atlantic Canada and United States / River, Reservoir or Impoundment, Estuary / Initiation of Stream Entry, Seasonal Timing - Water Level and Flow Rate / Smoltification / Speed of Migration - Reservoirs and Impoundments / Pattern - Reservoirs and Impoundments / Tagging, Count

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Atlantic Salmon - Fingerling, Alevin, Smolt / Atlantic Canada and United States / Smoltification, Organ Systems (General) - Physiological and Biochemical Aspects / Behaviour

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Atlantic Salmon - Smolt, Mature / Atlantic Canada and United States / River / Seasonal Timing - Age / Count, Tagging

1417

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Contributions of salmon from the northwest Miramichi River, New Brunswick, to various fisheries. -- J. Fish. Res. Board Can. 26(2):269-278.

Atlantic Salmon - Adult / Atlantic Canada and United States, Greenland / Inshore / Route / Tagging

1418

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Atlantic Salmon / Atlantic Canada and United States / Migration (General)

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Atlantic Salmon - Fingerling, Fry / Atlantic Canada and United States / River / Non Migratory Movements, Homing / Marking, Tagging

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Atlantic Salmon - Smolt / Atlantic Canada and United States / Smoltification, Seawater Adaptation - Physiological and Biochemical Aspects, Endocrine System (General) / Laboratory Study

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Atlantic Salmon - Smolt / Smoltification - Physiological and Biochemical Aspects

1423

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Atlantic Salmon - Adult / Atlantic Canada and United States, Greenland / Route / Tagging

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Atlantic Salmon / Migration (General) - Evolution

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Salmon (General) / Homing, Straying

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Salmon (General) / Direction Finding (General), Homing

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Atlantic Salmon - Smolt / Smoltification - Photoperiod, Size and Growth

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Atlantic Salmon - Mature / Atlantic Canada and United States / River / Seasonal Timing / Count

1429

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Atlantic Salmon - Mature, Smolt / Atlantic Canada and United States / River / Seasonal Timing / Count

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Chum Salmon, Coho Salmon - Mature / Inshore / Pattern - Current / Direction Finding (General) - Odours

1431

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Chum Salmon, Coho Salmon - Mature / Estuary / Direction Finding (General) - Odours / Pattern - Current / Sonic or Radio Tracking

1432

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Coho Salmon - Smolt / Smoltification - Physiological and Biochemical Aspects, Thyroid system, Photoperiod / Imprinting and Learning - Thyroid system / Olfactory system - Physiological and Biochemical Aspects

1433

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Coho Salmon - Smolt / Imprinting and Learning, Smoltification - Thyroid system, Interrenal system

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Coho Salmon - Juvenile / Olfactory system - Physiological and Biochemical Aspects / Imprinting and Learning

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Steelhead Trout - Fingerling, Smolt, Mature / Great Lakes / Tributary, Lake / Imprinting and Learning / Direction Finding (General) - Odours / Straying, Homing / Marking

1436

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Coho Salmon - Juvenile, Mature / Imprinting and Learning / Direction Finding (General) - Odours / Homing

1437

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Chinook Salmon - Mature / Oregon / River, Artificial Obstruction / Speed of Migration - Obstruction / Tagging

1438

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Salmon (General) - Smolt / Seasonal Timing, Behaviour / Smoltification - Endocrine System (General), Morphological Aspects, Physiological and Biochemical Aspects / Osmoregulatory and Excretory System - Physiological and Biochemical Aspects

1439

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Chum Salmon, Pink Salmon - Mature / California / Horizontal Distribution (Geographic)

1440

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Coho Salmon - Adult / Mexico / Inshore / Horizontal Distribution (Geographic)

1441

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Atlantic Salmon - Mature / Atlantic Canada and United States / River / Seasonal Timing - Genetic Aspects

1442

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Sockeye Salmon - Mature / Western Alaska / Inshore, Estuary, River / Seasonal Timing / Capture, Count

1443

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Pink Salmon, Chum Salmon, Sockeye Salmon, Coho Salmon, Chinook Salmon - Mature, Immature / Sea of Okhotsk, Western Pacific Ocean, Bering Sea, Eastern Kamchatka to Chuchuki Peninsula / Open Ocean / Horizontal Distribution (Geographic), Route - Water Temperature, Food Availability / Capture

1444

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Coho Salmon - Adult / Washington, Southern British Columbia, Oregon, California / Route / Marking

1445

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Pink Salmon - Mature / Western Arctic Russia, Iceland and Northern Europe / Inshore / Route

1446

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The homing instinct of trout and salmon. -- Proc. Pac. Sci. Congr. 6(3):317-322.

Salmon (General) / Homing

1447

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Steelhead Trout - Adult / California, Oregon / Inshore / Route, Speed of Migration, Straying / Tagging

1448

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Steelhead Trout, Coho Salmon / California / Migration (General)

1449

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Atlantic Salmon - Adult / Southern Europe / Inshore / Route / Tagging

1450

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Pink Salmon - Adult / Western Arctic Russia, Southern Europe / Route

1451

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The recapture of Scottish tagged salmon off the west Greenland coast. -- Scott. Fish. Bull. 22:19.

Atlantic Salmon - Adult / Southern Europe, Greenland / Route / Tagging

1452

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Atlantic Salmon - Mature / Southern Europe / River / Migration (General)

1453

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A Pacific salmon (*Oncorhynchus gorbuscha*) in Scottish waters. -- Nature 188:868.

Pink Salmon - Adult / Western Arctic Russia, Southern Europe / Route

1454

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Pink Salmon - Fry / Schooling - Salinity, Photoperiod, Water Temperature / Migration (General)

1455

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Chum Salmon - Fry / Preference - Salinity

1456

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Chum Salmon - Immature, Mature / Eastern Pacific Ocean, Western Pacific Ocean, Central Pacific Ocean, Bering Sea / Open Ocean / Route, Horizontal Distribution (Geographic) / Tagging / Stock Identification - Scale Analysis

1457

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Pink Salmon, Sockeye Salmon - Mature / Southeastern Alaska, Northern British Columbia, Southern British Columbia / Inshore / Route / Tagging

1458

Shepard, M.P., A.C. Hartt, and T. Yonemori. 1968.
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Chum Salmon - Immature, Mature / Pacific Ocean (General) / Open Ocean / Horizontal Distribution (Geographic), Seasonal Timing, Route, Speed of Migration / Capture, Tagging / Stock Identification - Scale Analysis, Parasite Tags, Morphometrics and Meristics, Electrophoresis and Serology

1459

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Sockeye Salmon, Chum Salmon, Pink Salmon, Coho Salmon, Steelhead Trout, Chinook Salmon - Adult / Eastern Pacific Ocean / Open Ocean / Horizontal Distribution (Geographic) / Capture

1460

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Sockeye Salmon, Pink Salmon - Adult / Eastern Pacific Ocean / Open Ocean / Seasonal Timing, Horizontal Distribution (Geographic) / Capture

1461

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Chum Salmon - Fry / Northern British Columbia / River, Estuary / Seasonal Timing, Initiation of Downstream Migration - Water Temperature, Water Level and Flow Rate / Diel Timing, Pattern, Route / Count

1462

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Pink Salmon - Fry, Mature / Southeastern Alaska / River / Seasonal Timing - Water Temperature, Water Level and Flow Rate

1463

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Pink Salmon - Fry / Sea of Japan / River / Seasonal Timing - Population Density / Diel Timing - Time of Year / Capture

1464

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Chum Salmon / Japan / Stock Identification - Biogeochemical Analysis

1465

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Hydrographic condition of the pink salmon fishing ground in the southern Kurile waters in June 1961-1964. -- Bull. Fac. Fish. Hokkaido Univ. 17(4):175-183.

In Japanese; English abstract.

Pink Salmon - Adult / Western Pacific Ocean / Inshore, Open Ocean / Horizontal Distribution (Geographic) - Water Temperature / Capture

1466

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Masu Salmon - Adult / Sea of Okhotsk / Open Ocean / Seasonal Timing, Route / Capture

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Chum Salmon - Adult / Sea of Japan / Horizontal Distribution (Geographic) - Water Temperature

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Sockeye Salmon - Juvenile / Japan / Lake / Non Migratory Movements, Diel Timing

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Chinook Salmon - Immature / Southern British Columbia / Estuary / Pattern

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Chinook Salmon - Mature / Southern British Columbia / Estuary, River / Initiation of Stream Entry, Seasonal Timing - Water Level and Flow Rate / Modelling

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Sockeye Salmon - Fry, Fingerling / Northern British Columbia / Lake / Non Migratory Movements / Modelling

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Salmon (General) / Orientation

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Sockeye Salmon - Juvenile / Lake / Orientation - Time of Year, Time of Day / Laboratory Study

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Sockeye Salmon, Chinook Salmon - Juvenile / Oregon, Colorado, Idaho / Reservoir or Impoundment / Seasonal Timing / Count

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Coho Salmon - Smolt, Fingerling / Oregon / Tributary / Direction, Seasonal Timing, Migration (General) / Count

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Pink Salmon - Mature / River, Inshore / Seasonal Timing - Size and Growth

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Chinook Salmon - Mature, Juvenile / California / River / Seasonal Timing

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Steelhead Trout - Juvenile, Mature / Imprinting and Learning / Homing

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Pink Salmon - Mature / California / Horizontal Distribution (Geographic)

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Coho Salmon - Mature / Eastern Kamchatka to Chuchuki Peninsula, Sea of Okhotsk / River / Seasonal Timing

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Pacific Salmon (General) / Migration (General)

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Pink Salmon - Fry / River / Diel Timing - Evolution / Seasonal Timing - Age, Influences (Miscellaneous) / Initiation of Downstream Migration - Light Intensity, Water Level and Flow Rate, Water Temperature

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Atlantic Salmon - Mature / Iceland and Northern Europe / Estuary, River / Initiation of Stream Entry - Weather, Current, Water Level and Flow Rate, Water Temperature / Seasonal Timing, Speed of Migration

1489

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Chinook Salmon - Alevin / Behaviour - Light Intensity

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Atlantic Salmon - Mature / Southern Europe / Route

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Sockeye Salmon - Mature / Western Alaska / Lake / Tributary / Route, Seasonal Timing / Tagging

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Sockeye Salmon - Smolt / Northern British Columbia / Lake, River / Energetics / Parasites

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Timing of Babine Lake sockeye salmon stocks in the north-coast commercial fishery as shown by several taggings at the Babine counting fence and rates of travel through Skeena and Babine Rivers. -- Fish. Res. Board Can. Tech. Rep. 418:31p.

Sockeye Salmon - Mature / Northern British Columbia / River, Tributary, Inshore / Seasonal Timing, Speed of Migration

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Chinook Salmon, Steelhead Trout - Juvenile / Washington / River, Reservoir or Impoundment / Vertical Distribution / Capture

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Chinook Salmon, Coho Salmon, Steelhead Trout - Juvenile / Washington / Reservoir or Impoundment / Vertical Distribution, Direction / Capture

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Pacific Salmon (General) - Smolt / Speed of Migration, Behaviour, Voluntary Displacement / Locomotory System - Physiological and Biochemical Aspects

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Atlantic Salmon - Smolt / Guiding

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A note on two stocks of steelhead trout (*Salmo gairdneri*) in Capilano River, British Columbia. -- J. Fish. Res. Board Can. 17(5):739-742.

Steelhead Trout - Mature / Southern British Columbia / River / Seasonal Timing - Genetic Aspects

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Atlantic Salmon - Fry / Seawater Adaptation / Laboratory Study

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Chinook Salmon - Adult / California / Inshore / Route / Marking

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Chinook Salmon - Adult / California / Inshore / Route / Marking

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Chinook Salmon - Adult / California / Inshore, River / Route, Homing / Marking

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Chinook Salmon - Juvenile, Adult, Mature / California / River, Inshore / Route, Homing / Initiation of Stream Entry - Tide / Seasonal Timing, Pattern / Skeletal and Integumentary System - Morphological Aspects (Stage of Migration) / Marking

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Steelhead Trout - Mature / California / River / Seasonal Timing / Count

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Chinook Salmon - Adult / California / Homing / Marking

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Masu Salmon, Pink Salmon, Chum Salmon - Mature / Sea of Okhotsk / River / Seasonal Timing / Skeletal and Integumentary System - Morphological Aspects (Stage of Migration) / Pattern

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Sockeye Salmon - Mature / River / Freshwater Adaptation / Osmoregulatory and Excretory System - Physiological and Biochemical Aspects / Endocrine System (General)

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Evidence for pheromone-influenced homing by migrating Atlantic salmon, *Salmo salar* (L.). -- Nature 244:231-232.

Atlantic Salmon - Mature / Estuary, River / Direction Finding (General) - Odours, Pheromones

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Atlantic Salmon - Smolt / Southern Europe / River / Initiation of Downstream Migration, Seasonal Timing - Light Intensity, Water Temperature, Turbidity, Weather, Water Level and Flow Rate / Count

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Atlantic Salmon - Smolt / Southern Europe / River / Initiation of Downstream Migration, Diel Timing - Water Temperature, Influences (Miscellaneous) / Speed of Migration, Behaviour / Sonic or Radio Tracking, Count

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Atlantic Salmon - Smolt / Southern Europe / River / Initiation of Downstream Migration - Water Temperature, Water Level and Flow Rate

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Coho Salmon - Immature / Southern British Columbia / Inshore / Route / Tagging

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Coho Salmon - Immature / Southern British Columbia / Inshore / Route / Tagging

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Coho Salmon - Smolt / Smoltification, Osmoregulatory and Excretory System - Physiological and Biochemical Aspects / Pituitary System / Thyroid System / Interrenal System

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Salmon (General) - Smolt / Smoltification - Physiological and Biochemical Aspects / Interrenal System

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Coho Salmon - Smolt / Smoltification - Physiological and Biochemical Aspects / Interrenal System / Thyroid System

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Salmon (General), Steelhead Trout - Juvenile / Preference - Salinity / Laboratory Study

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Atlantic Salmon - Fingerling / Taxis - Current (Odours) / Direction Finding (General) - Odours, Pheromones / Laboratory Study

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Stabell, O.B. 1982.
Homing of Atlantic salmon in relation to olfaction and genetics. Pp.238-246 in E.L. Brannon and E.O. Salo (ed.). Proceedings of the Salmon and Trout Migratory Behavior Symposium. -- School of Fisheries, University of Washington, Seattle, Washington.

Atlantic Salmon - Mature / Homing - Genetic Aspects / Direction Finding (General) - Odours

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Atlantic Salmon / Iceland and Northern Europe / Direction Finding (General) - Pheromones / Olfactory System - Physiological and Biochemical Aspects

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Chinook Salmon, Steelhead Trout - Mature / Washington, Oregon, Colorado, Idaho / River, Artificial Obstruction, Reservoir or Impoundment / Termination of Migration, Initiation of Stream Entry - Water Temperature / Straying, Homing / Sonic or Radio Tracking, Tagging

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Review of field studies on fish orientation. -- Ann. N.Y. Acad. Sci. 188:12-29.

Salmon (General) / Direction Finding (General)

1525

Stasko, A.B. 1975.
Progress of migrating Atlantic salmon, (Salmo salar) along an estuary, observed by ultrasonic tracking. -- J. Fish Biol. 7:329-338.

Atlantic Salmon - Mature / Atlantic Canada and United States / Estuary / Direction Finding (General), Speed of Migration, Pattern - Tide, Current / Sonic or Radio Tracking

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Stasko, A.B., R.M. Horrall, and A.D. Hasler. 1976.
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Sockeye Salmon - Mature / Southern British Columbia, Washington / Inshore / Speed of Migration, Behaviour, Reverse Migration, Vertical Distribution / Route, Direction - Current, Landmarks, Weather, Light Intensity / Orientation - Electric Fields, Influences (Miscellaneous) / Sonic or Radio Tracking

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Coastal movements of mature Fraser River pink salmon (*Oncorhynchus gorbuscha*) as revealed by ultrasonic tracking. -- J. Fish. Res. Board Can. 30(9):1309-1316.

Pink Salmon - Mature / Washington / Inshore / Speed of Migration, Behaviour, Orientation, Pattern, Route / Direction Finding (General) - Electric Fields, Current / Sonic or Radio Tracking

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Salmon (General) / Sonic or Radio Tracking

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Atlantic Salmon / Sonic or Radio Tracking

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Migration - orientation of Atlantic salmon, Salmo salar L. -- Int. Atlantic Salmon Found. Spec. Publ. Ser. 4(1):119-137.

Atlantic Salmon - Smolt, Adult, Mature / Inshore, Open Ocean, Estuary, River / Direction Finding (General) - Gravity, Current, Magnetic Field, Electric Fields, Odours, Pheromones / Homing, Straying / Behaviour, Speed of Migration

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Stevens, D.G., A.V. Nebeker, and R.J. Baker. 1980.
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Coho Salmon, Sockeye Salmon, Chinook Salmon, Steelhead Trout - Juvenile / Preference - Dissolved Gas Concentration / Laboratory Study

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Salmon (General) / Tagging, Marking

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Sockeye Salmon - Smolt / Western Alaska / River, Lake / Seasonal Timing / Count

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1967 Bristol Bay red salmon smolt studies. -- Alaska Dep. Fish Game Inf. Leafl. 134:69p.

Sockeye Salmon - Smolt / Western Alaska / River, Lake / Initiation of Downstream Migration, Seasonal Timing - Water Temperature, Influences (Miscellaneous)

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Salmon (General) / Route - Current / Migration (General)

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Chinook Salmon - Juvenile / Seawater Adaptation, Osmoregulatory and Excretory System - Physiological and Biochemical Aspects / Interrenal System / Laboratory Study

1537

Straty, R.R. 1969.
The migratory pattern of adult sockeye salmon (Oncorhynchus nerka) in Bristol Bay as related to the distribution of their home-river waters. -- Ph.D. thesis. -- Oregon State University, Corvallis, Oregon. -- 262p.

Sockeye Salmon - Mature / Western Alaska / Inshore, Open Ocean / Route, Pattern / Migration (General)

1538

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Sockeye Salmon - Immature / Western Alaska / Inshore / Route - Water Temperature / Pattern, Seasonal Timing, Vertical Distribution, Schooling / Direction Finding (General) - Salinity / Speed of Migration - Food Availability

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Estuarine influence of salinity, temperature, and food on the behavior, growth, and dynamics of Bristol Bay sockeye salmon. Pp.247-265 in W.J. McNeil and D.C. Himsworth (ed.). Salmonid ecosystems of the North Pacific. -- Oregon State University Press, Corvallis, Oregon.

Sockeye Salmon - Immature / Western Alaska / Inshore / Direction Finding (General) - Salinity / Route - Water

Temperature / Speed of Migration - Food Availability, Water Temperature

1540

Struthers, G. 1975.
Rapid movement of a salmon tagged off the Faroes. -- Scott. Fish. Bull. 41:22.

Atlantic Salmon - Adult / Southern Europe / Inshore / Speed of Migration / Tagging

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The leaping behaviour of salmon and trout at falls and obstructions. -- Scotl. Dep. Agric. Fish. Freshwater Salmon Fish. Res. 28:46p.

Atlantic Salmon - Juvenile, Mature / Behaviour - Current, Obstruction

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Stuart, T.A. 1964.
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Salmon (General) - Adult / Behaviour

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In Japanese; English abstract.

Pacific Salmon (General) / Sea of Okhotsk / Inshore / Migration (General)

1544

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The depth and distance from shore of the routes of migration of salmon. -- Bull. Jap. Soc. Sci. Fish. 4(5):318-320.

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Pink Salmon, Chum Salmon, Sockeye Salmon - Adult / Sea of Okhotsk / Inshore / Direction - Time of Year / Pattern, Vertical Distribution / Capture

1545

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In Japanese; English abstract.

Masu Salmon - Immature / Japan / Inshore / Route - Water Temperature, Current / Tagging

1546

Sullivan, C.M. 1954.
Temperature reception and responses in fish. -- J. Fish. Res. Board Can. 11(2):153-170.

Salmon (General) / Migration (General) - Water Temperature

1547

Sumner, F.H. 1952.
Migration of salmonids in Sand Creek, Oregon. -- Trans. Am. Fish. Soc. 82:139-150.

Chum Salmon, Coho Salmon, Steelhead Trout - Mature, Fry / Oregon / River, Tributary / Seasonal Timing / Count

1548

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Distribution, seasonal abundance, and some biological features of steelhead trout, Salmo gairdneri in the North Pacific Ocean. -- Fish. Bull. 71(3):787-826.

Steelhead Trout - Immature, Mature / Eastern Pacific Ocean, Western Pacific Ocean, Central Pacific Ocean, Bering Sea / Open Ocean / Horizontal Distribution (Geographic) - Water Temperature / Seasonal Timing, Route, Speed of Migration / Tagging, Capture

1549

Sutterlin, A.M., and R. Gray. 1973.
Chemical basis for homing of Atlantic salmon (Salmo salar) to a hatchery. -- J. Fish. Res. Board Can. 30(7):985-989.

Atlantic Salmon - Mature / Atlantic Canada and United States / River / Direction Finding (General) - Odours / Homing

1550

Sutterlin, A.M., K.J. Jokola, and B. Holte. 1979.
Swimming behavior of salmonid fish in ocean pens. -- J. Fish. Res. Board Can. 36(8):948-954.

Atlantic Salmon - Adult / Behaviour, Direction Finding (General) / Laboratory Study

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Atlantic Salmon - Immature / Southern Europe, Greenland / Route / Tagging

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Coho Salmon - Adult / California / Inshore / Route / Marking

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Coho Salmon - Smolt / Japan / River / Seasonal Timing / Count

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Chinook Salmon, Chum Salmon, Sockeye Salmon, Coho Salmon, Steelhead Trout - Mature / Washington, Oregon / River, Artificial Obstruction / Seasonal Timing - Water Level and Flow Rate / Diel Timing, Reverse Migration / Count

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Passage of fish over Bonneville Dam, Columbia River, Oregon and Washington: annual report 1949. Portland, Oregon. -- 1v. (various pagings)

Chinook Salmon, Chum Salmon, Sockeye Salmon, Coho Salmon, Steelhead Trout - Mature / Washington, Oregon / River, Artificial Obstruction / Seasonal Timing, Pattern / Count, Tagging

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Chinook Salmon, Chum Salmon, Coho Salmon, Sockeye Salmon, Steelhead Trout - Mature / Oregon, Washington / River, Artificial Obstruction / Seasonal Timing / Count

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Chinook Salmon, Chum Salmon, Coho Salmon, Sockeye Salmon, Steelhead Trout - Mature / Washington, Oregon / River, Artificial Obstruction / Seasonal Timing / Count

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Steelhead Trout - Mature / Washington, Oregon / River, Artificial Obstruction / Seasonal Timing, Pattern - Obstruction / Tagging

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Chinook Salmon, Chum Salmon, Sockeye Salmon, Coho Salmon, Steelhead Trout - Mature / Washington, Oregon / River, Artificial Obstruction / Seasonal Timing / Count

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Passage of fish over Bonneville and McNary Dams, Columbia River, Oregon and Washington: annual report 1957. Portland, Oregon. -- 1v. (various pagings)

Chinook Salmon, Coho Salmon, Chum Salmon, Sockeye Salmon, Steelhead Trout - Mature / Washington, Oregon / River, Artificial Obstruction / Seasonal Timing / Count

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Chinook Salmon, Coho Salmon, Chum Salmon, Sockeye Salmon, Steelhead Trout - Mature / Oregon, Washington / River, Artificial Obstruction / Seasonal Timing / Count

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Chinook Salmon, Coho Salmon, Chum Salmon, Sockeye Salmon, Steelhead Trout - Mature / Oregon, Washington / River, Artificial Obstruction / Seasonal Timing / Count

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Chinook Salmon, Chum Salmon, Coho Salmon, Sockeye Salmon, Steelhead Trout - Mature / Oregon, Washington / Artificial Obstruction, River / Seasonal Timing / Count

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Steelhead Trout, Sockeye Salmon, Coho Salmon, Chinook Salmon, Chum Salmon - Mature / Oregon, Washington / River, Artificial Obstruction / Seasonal Timing / Count

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Atlantic Salmon - Mature / Southern Europe / Inshore / Speed of Migration, Route / Tagging

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Atlantic Salmon - Mature / Southern Europe / Inshore / Route, Speed of Migration / Tagging

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Atlantic Salmon - Mature / Southern Europe / Inshore / Route, Speed of Migration / Tagging

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Atlantic Salmon - Mature / Southern Europe / Inshore / Route, Speed of Migration / Tagging

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Atlantic Salmon - Adult / Southern Europe / Inshore / Route, Speed of Migration / Tagging

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Atlantic Salmon - Mature, Adult / Southern Europe / Inshore / Route, Speed of Migration / Tagging

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Atlantic Salmon - Adult / Atlantic Ocean (General) / Open Ocean / Route / Tagging

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Atlantic Salmon - Adult / Southern Europe / Inshore / Route, Speed of Migration / Tagging

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Atlantic Salmon - Mature / Southern Europe / Inshore / Route, Speed of Migration / Tagging

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Pink Salmon - Adult / Southern Europe / Horizontal Distribution (Geographic)

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Atlantic Salmon - Mature / River / Direction Finding (General) - Influences (Miscellaneous) / Homing

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Water Temperature / Diel Timing, Homing, Reverse Migration / Count, Tagging, Marking

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Atlantic Salmon - Mature, Kelt / Atlantic Canada and United States / River / Skeletal and Integumentary System - Morphological Aspects (Stage of Migration) / Freshwater Adaptation

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Chinook Salmon - Mature / River / Direction Finding (General) - Odours (Pollutants) / Homing, Straying - Pollutants

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Coho Salmon, Chinook Salmon - Juvenile / Preference - Dissolved Gas Concentration / Laboratory Study

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Chum Salmon - Mature / Southern British Columbia / River / Seasonal Timing

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Chum Salmon - Adult / California / Inshore / Horizontal Distribution (Geographic)

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Atlantic Salmon - Fingerling, Smolt / Atlantic Canada and United States / River / Initiation of Downstream Migration, Seasonal Timing - Water Temperature, Water Level and Flow Rate / Count

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Atlantic Salmon / Atlantic Ocean (General) / Stock Identification - Electrophoresis and Serology

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Atlantic Salmon / Atlantic Ocean (General) / Stock Identification - Electrophoresis and Serology

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Atlantic Salmon / Atlantic Ocean (General) / Stock Identification - Electrophoresis and Serology

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Sockeye Salmon, Chinook Salmon - Mature / Southern British Columbia, Northern British Columbia, Washington, Oregon / Inshore / Route / Speed of Migration / Tagging

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Coho Salmon, Chinook Salmon - Mature / Southern British Columbia, Washington / Inshore / Route, Speed of Migration / Tagging

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Coho Salmon, Chinook Salmon - Mature / Southern British Columbia, Washington / Inshore / Route, Speed of Migration / Tagging

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Pink Salmon - Mature / Western Arctic Russia, Southern Europe / Route

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Chinook Salmon - Adult / Southeastern Alaska, Oregon / Inshore / Route / Tagging

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Pacific Salmon (General) / Migration (General)

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Steelhead Trout - Mature / Southern British Columbia / River, Tributary / Seasonal Timing / Initiation of Stream Entry - Water Level and Flow Rate

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Sockeye Salmon - Mature / Inshore, River, Tributary / Freshwater Adaptation / Organ Systems (General) - Physiological and Biochemical Aspects (Stage of Migration) / Laboratory Study

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Sockeye Salmon - Mature / Inshore, River, Tributary / Organ Systems (General) - Physiological and Biochemical Aspects (Stage of Migration) / Freshwater Adaptation / Laboratory Study

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Steelhead Trout, Atlantic Salmon - Alevin / Taxis, Behaviour - Light Intensity / Laboratory Study

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Pink Salmon / Stock Identification

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Pink Salmon / Central Alaska / Stock Identification - Scale Analysis

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Coho Salmon, Chinook Salmon - Adult / Washington / Inshore / Seasonal Timing / Capture

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Chinook Salmon, Coho Salmon - Immature, Mature / California, Oregon, Washington, Southern British Columbia, Northern British Columbia / Inshore / Route

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Masu Salmon - Fingerling, Smolt, Immature, Mature / Ultimobranchial System - Morphological Aspects (Stage of Migration) / Laboratory Study

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Masu Salmon / Smoltification - Physiological and Biochemical Aspects, Morphological Aspects

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Atlantic Salmon - Fingerling, Smolt / Iceland and Northern Europe / Tributary / Smoltification - Water Temperature, Size and Growth, Morphological Aspects / Thyroid System / Initiation of Downstream Migration - Water Level and Flow Rate, Water Temperature

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Atlantic Salmon - Fingerling, Smolt / Iceland and Northern Europe / Smoltification

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Atlantic Salmon - Fingerling, Smolt / Iceland and Northern Europe / Smoltification - Size and Growth / Desmoltification, Seawater Adaptation

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Chum Salmon - Mature / Japan / River, Inshore / Circulatory System - Physiological and Biochemical Aspects (Stage of Migration) / Laboratory Study

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Sockeye Salmon, Chum Salmon, Pink Salmon - Immature, Mature / Bering Sea / Open Ocean / Horizontal Distribution (Geographic), Route / Capture, Tagging

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Chum Salmon - Immature, Mature / Japan, Sea of Okhotsk, Western Pacific Ocean, Central Pacific Ocean, Eastern Pacific Ocean, Bering Sea / Open Ocean / Route - Current / Seasonal Timing / Tagging / Stock Identification - Scale Analysis

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Chum Salmon - Immature, Adult / Japan / Inshore, Open Ocean / Horizontal Distribution (Geographic) - Water Temperature, Time of Year / Route / Tagging, Capture

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Sockeye Salmon, Chum Salmon - Adult / Bering Sea, Western Pacific Ocean / Open Ocean / Seasonal Timing / Capture

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Sockeye Salmon - Smolt, Mature / Eastern Kamchatka to Chuchuki Peninsula / River / Osmoregulatory and Excretory System - Physiological and Biochemical Aspects

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Chum Salmon - Mature / Japan / Estuary, River / Digestive System - Physiological and Biochemical Aspects (Stage of Migration) / Freshwater Adaptation / Laboratory Study

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Atlantic Salmon - Mature / Iceland and Northern Europe / River / Seasonal Timing

1777

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Atlantic Salmon - Mature / Iceland and Northern Europe / River / Seasonal Timing

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Coho Salmon - Juvenile / Preference - Salinity / Seawater Adaptation - Physiological and Biochemical Aspects

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Steelhead Trout - Juvenile / Osmoregulatory and Excretory System, Smoltification - Photoperiod, Water Temperature, Size and Growth / Initiation of Downstream Migration - Photoperiod, Water Temperature / Laboratory Study

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Steelhead Trout, Chinook Salmon, Coho Salmon - Juvenile / Coho Salmon - Smolt / Washington / River / Smoltification, Osmoregulatory and Excretory System - Physiological and Biochemical Aspects / Desmoltification

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Chinook Salmon, Coho Salmon - Smolt / Seawater Adaptation, Smoltification - Physiological and Biochemical Aspects

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Steelhead Trout - Juvenile / River / Osmoregulatory and Excretory System / Smoltification - Physiological and Biochemical Aspects (Water Temperature)

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Coho Salmon - Juvenile / Seawater Adaptation, Osmoregulatory and Excretory System - Physiological and Biochemical Aspects / Laboratory Study

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Coho Salmon - Juvenile / Osmoregulatory and Excretory System - Physiological and Biochemical Aspects (Time of Year) / Seawater Adaptation - Physiological and Biochemical Aspects / Laboratory Study

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Steelhead Trout, Coho Salmon, Chinook Salmon - Fingerling, Smolt / Washington / Osmoregulatory and Excretory System - Physiological and Biochemical Aspects (Time of Year, Size and Growth) / Smoltification, Seawater Adaptation / Laboratory Study

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Coho Salmon - Fingerling, Smolt / Osmoregulatory and Excretory System, Smoltification - Physiological and Biochemical Aspects (Water Temperature) / Laboratory Study

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Steelhead Trout - Fingerling, Smolt / Osmoregulatory and Excretory System, Smoltification - Physiological and Biochemical Aspects (Photoperiod, Water Temperature) / Initiation of Downstream Migration - Photoperiod / Laboratory Study

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Chum Salmon - Mature / Japan / Estuary, River / Digestive System - Physiological and Biochemical Aspects (Stage of Migration) / Freshwater Adaptation / Laboratory Study

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Chinook Salmon, Steelhead Trout, Sockeye Salmon, Coho Salmon - Mature / Washington / River, Artificial Obstruction / Seasonal Timing / Count

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Steelhead Trout, Sockeye Salmon, Coho Salmon, Chinook Salmon - Mature / Washington / River, Artificial Obstruction / Seasonal Timing / Count

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Chinook Salmon, Sockeye Salmon, Steelhead Trout - Mature / Washington / River, Artificial Obstruction / Seasonal Timing / Count

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Annual fish passage report - Rock Island Dam, Columbia River, Washington, 1964. -- U.S. Fish Wildl. Serv. Spec. Sci. Rep. Fish. 515:23p.

Steelhead Trout, Chinook Salmon, Sockeye Salmon - Mature / Washington / Artificial Obstruction, River / Seasonal Timing / Count

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